4.10 Chainsaw milling and rainforest dynamics in southern Nigeria

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Introduction

The Nigerian rainforest is located between latitude 4^0 and 9^0 N (Figure 1). It stretches east-west across the country, extending about 250 km inland from the coast (Ojo and Ola-Adams 1996). The biome is a continuation of the western block of the African rainforest formation.[1]

Redhead (1971) arranged Nigerian rainforest trees into three utilization classes: Class I includes species of major economic timber importance (e.g., *Milicia* and *Baillonella*); Class II includes species of lesser timber importance (e.g., *Lophira* and *Mitragyna*); Class III includes species of possible timber importance (e.g., *Alstonia* and *Celtis*); and Class IV includes species likely to be of use only for fuel, charcoal or industrial use.

The population of southern Nigeria is almost 65 million on a total land area of 20 million hectares (NPC 2006). The south, where the rainforest is found, is the most densely populated part of the country, with an average population density of 324 persons/km^2 (the national average is 150 people/km^2).

Nigerian Forest Policy

Chainsaw milling will easily disrupt the forest's regenerative capability when disturbance goes beyond the ecosystem's limits.

The Nigerian Forest Department (FD) was created in 1902 (Dawkins and Philip 1998). According to Okali and Fasehun (1995), the timber rules of 1906 and the forest ordinance of 1916 were the earliest management regulations introduced after the FD was created. These were directed at conservation and improvement: the 1906 rules mandated loggers to plant new or tend existing seedlings to replace trees that were felled; and the 1916 ordinance favoured planting of 24 economic timber trees to replace each tree felled. Forest reserve constitution and silvicultural experimentation dominated the period 1910 through 1940. The management of forests was devolved from national to regional control in 1952.

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Figure 1.
Administrative map of Nigeria

The post-independence military incursion into political governance significantly altered the structure of the state and private sector cooperation towards sustainable forest management through long-term forest concessions. The 100-year rotation that operated in what was the midwest region (now Edo and Delta States) and western region (Lagos, Oyo, Ogun, Ekiti, Ondo and Osun States) was replaced with a 25-year felling cycle; it was subsequently reduced again to five-year and then three-year rotations respectively. he primary objective of long-term concessions was to maintain the ecological integrity of production forests through sustained yield management by encouraging partnerships between concessionaires and the state. To achieve this goal, concessionaires had the mandate to prepare working plans and carry out forest inventories and a few development activities within the concessions; the state performed monitoring and advisory work.

The 1999 constitution of the Federal Republic of Nigeria places the protection of the environment and of air, water and land — including forests and wildlife — under state governments. The 2006 National Forestry Policy was the first stand-alone document to be produced through a participatory process.

The principles underlying the 2006 forest policy are designed to address forest decline, streamline the contribution of forests to economic development, mobilize community and civil society toward forestry development, address transparency in the tendering of forest concessions, promote partnership with the private sector, seek international cooperation, engender forest policy initiatives, and mainstream forestry into the Millennium Development Goals. As laudable as the policy is, however, it has not yet been put into effect because the *National Forestry Act*, which is supposed to harmonize/streamline the different state's forestry laws and edicts, has not been passed by the National Assembly. In the absence of the *Forestry Act*, the 1988 National Agricultural Policy — which subordinates forestry and allied matters — is still operational. The 1988 policy considers the forestry sector an appendage of the larger agricultural sector, making its valuation and overall contribution to GDP difficult to capture.

In a few rainforest states, such as Ondo, Osun and Cross River (where the government is involved in collaborative arrangements with local communities in the management of forest resources), chainsaw milling (CSM) is backed by law in off-reserve areas and permits are issued on a stumpage or single-tree basis. Generally, there is pervasive abuse of the single permit process: chainsaw millers surreptitiously obtain multiple owner's consent from traditional institutions as well as permits/licences from the forestry departments for use by the same or different millers in the same or adjoining areas. This offers

easy shortcuts for contractors or permit holders to substitute owner's/traditional ruler's royalties with licences/permits from the forestry department.

In other rainforest states, e.g., Edo, diverse interest groups (largely made up of rent-captors) find their way through political appointments onto extra-departmental forest/log monitoring committees and engage cronies to carry out the same statutory functions as government officials. Unlike paid government officials, however, they handle offences detected in both the forest reserves and off-reserve areas with subversive intent and in tacit defiance of the law. Interestingly, offenders are charged outrageous fines but only a paltry sum makes it to the government purse. Citing the dearth of trained staff in Edo State (where only 101 forest guards are deployed to protect forest reserves covering 6,000 km^2), the World Bank (2005, 78) identified "weak and obsolete laws, poor work environment and lack of security for personnel as plausible disincentives" as requiring urgent attention.

Historical perspective

CSM was scarcely practised before the 1960s, but it gradually succeeded pit-sawing and later gained prominence as quick conversion apparatus in southern Nigeria. While the political exigency of the post-war 1970s and compelling socio-economic demands — which increased the demand for timber — could be responsible for the abolishment of the concessions, the instability they caused negatively affected the economic fortunes of most wood-based companies. Many companies were compelled to fold up while the remaining few survivors scaled back their operations.

Against the backdrop of mounting governance costs, some state military governments (with large tracts of production forests) exploited their forests to shore up revenue, under the mistaken premise that timber was a renewable natural capital capable of generating steady returns. This phenomenon created free entry for a large number of small concessionaires, who explored cheaper and faster options of milling.

CSM received widespread attention in areas where customary tree tenure systems permit revenue from the timber resource to be shared by the government and the traditional ruler. This was particularly the case in off-reserve areas or community-managed forests governed by traditional institutions. The system involves the issuance of felling permits on a stumpage (per tree) basis by the state forestry department, which collects the revenue and pays royalties as a lump sum to the traditional ruler in the locality. The system was fraught with abuses, however, and land owners who grew trees on farmlands had to obtain permits before cutting them down.

Chainsaw milling and livelihoods

CSM provides ample opportunities for sustaining rural and family incomes. Rural youth and women are mostly engaged in carrying lumber products to gantries or loading bays and timber sheds.

The diffuse and aggressive nature of the market for chainsawn timber products (billets, boards and rafters) in many parts of Nigeria is partly due to the relative ease with which the product is converted and transported, and partly to the prices, which are lower than those of timber from conventional sawmills. Another advantage is that chainsawn timber products can be made to the buyer specifications, while the species and selection of products for commerce or distant markets is largely dictated by forces of demand and supply. Pagiola, Lindell-Mills and Bishop (2005) argue that market-based approaches can provide powerful incentives and efficient means of conserving forest and the public goods they provide while at the same time offering new sources of income to support livelihood needs.

Impact on the rainforest ecosystem

As mature timber trees became scarce due to harvesting pressure chainsaw milling developed into a full blown commercial business and extended to planted forests as well as forests in inaccessible terrain (undulating landscapes, gorges/valleys and other marginal areas).

Timber harvesting in the fragile moist rainforest increases diversity, but the quality of species that make up the residual forest that follows depend on the intensity of removal, availability, age and quality of key species as well as the phase of succession (Whitmore 1996; Kio 1978; Bruenig 1996). According to Peters (1996, 40), "uncontrolled selective logging can reduce the local abundance of certain valuable timber trees, particularly among the climax species."

On-site CSM does not only encourage systematic selection and excessive harvesting, it could lead to serious ecosystem damage, genetic erosion and/or scarcity of endemic species population in a fragile rainforest ecosystem. According to Serageldin (1992, 338) "most of these species are not found in any other type of ecosystems; many are so restricted that in their geographic ranges - they are only found within one forest or only a small part of the forest." The current paucity of most endemic climax species (particularly among the *Meliaceae, Leguminoceae, Myristicaceae, Rubiaceae* and *Samidaceae* families) with small geographic ranges in the rainforest ecosystem in southern Nigeria is attributable to the impact of indiscriminate on-site milling.

Linhart (1995) observed that species within small geographic ranges tend to have less genetic variability than widespread species and are therefore more vulnerable to abrupt environmental changes. Most Nigerian rainforest tree species, e.g., *Alanblackia floribunda*, are poorly adapted to recovering from bole damage due to logging.[2] *Alanblackia* and similar species carrying monopodial crowns face the greatest threat of extinction.

Generally, logging of any type in the fragile rainforest of Nigeria has become less attractive because the resources have been depleted beyond the limits of the ecosystem. It is no longer feasible to carry out commercial logging because of the high percentage of immature trees and juveniles.

Conclusion

Mature timber trees are in increasingly short supply in both forest reserves and off-reserve areas in southern Nigeria. The surge in population in southern Nigeria will exert enormous pressure on the rainforest and its resources in the coming decades. More tree species will be lost — and replaced by timber of lesser value — and the ecosystem will be rendered more ecologically fragile.

CSM will easily disrupt the forest's regenerative capability when disturbance goes beyond the ecosystem's limits. The argument that on-site CSM is less damaging to the forest ecosystem than other forms of logging does not apply in all forest situations, particularly in the current Nigerian context.

A national forest policy supported by the *Forestry Act* is essential for the planning and implementation of all national forest and biodiversity programmes, including climate change issues. The three tiers of government must act in concert and pool resources to drive the process of change. The current arrangement, whereby a fund set aside for the control and management of all forms of ecological degradation in the country is domiciled in the presidency and managed on behalf of states and local governments, is not only regressive but creates room for corruption and mismanagement of scarce resources.

The fragile nature of the ecosystems and the frightening state of degradation across the nation's landscape demand concerted efforts by all stakeholders — government, civil society, NGOs and CBOs, communities and the private sector — in order to reverse the overwhelming ecological ravages across the land and the ensuing erosion of biodiversity and loss of ecosystems. Chainsaw milling should be adequately accommodated in national and state forest policies and in biodiversity action plans and laws.

Finally, an autonomous ministry with a support department and agency should be created at the state level with replicate functions at the local government level to handle forestry and allied matters, including management of special ecological funds.

Endnotes

1. This extends west from Ghana to Sierra Leone and the Guinea Highlands, and to the eastern extension of the forest of Cross River State into Cameroon and Gabon, and southeast to the tropical rainforest of Zaire and Central Africa (Onochie 1979).
2. The species produces recalcitrant seeds that are poorly represented in the seed and seedling banks in the forest floor and understorey. It also has a single apical shoot which is ill-equipped to re-enact or grow through buds if the tree bole/crown is snapped by wind or falling trees.

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